

FEMS-1480 Microbes and alternative energy sources

CHARACTERIZATION OF AN ANAEROBIC THERMOPHILIC GLYCEROLDEGRADING ENRICHMENT CULTURE

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Background: The glycerol market was totally changed by the biodiesel industry, which resulted in the production of an excess of this compound as an industrial by-product. As a consequence, the price of glycerol dropped and a huge interest in alternatives for its valorisation emerged since then. In the field of Biotechnology research, glycerol is an attractive compound for the microbial production of chemical building blocks.

Objectives: The aim of this work was to investigate thermophilic anaerobic communities capable of conversion of glycerol.

Methods: Thermophilic sludge from a lab-scale anaerobic reactor fed with skim milk and sodium oleate (50:50% chemical oxygen demand) was incubated at 55°C in closed bottles containing bicarbonate-buffered medium supplemented with 10mM glycerol. Periodic successive transfers of the glycerol-converting enrichment culture, combined with serial dilutions were performed. After eight generations a highly enriched, low diversity (microscopic observations and 16s rRNA DGGE profiling) microbial culture was obtained.

Conclusions: The enriched culture converted glycerol mainly to methane (6mM) and acetate (7mM) within 6 days of incubation. A yet unknown organic compound was also produced. Sequencing results obtained on the Illumina platform showed the bacterial predominance of an uncultured *Thermotoga* species (75 % of the retrieved sequences), an uncultured *Anaerobaculum* species (13 %) and a close relative to *Thermoanaerobacter pseudethanolicus* (5 %). Isolation of the new uncultured *Thermotoga* and *Anaerobaculum* species is ongoing and their role in glycerol degradation will be assessed.